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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/816,576	03/24/2004	Hou Tee Ng	ARC-15042-2	9400
25186	7590	08/23/2005	EXAMINER	
NASA AMES RESEARCH CENTER ATTN: PATENT COUNSEL MAIL STOP 202A-4 MOFFETT FIELD, CA 94035-1000			NGUYEN, THANH T	
			ART UNIT	PAPER NUMBER
			2813	

DATE MAILED: 08/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 10/816,576	Applicant(s) NG ET AL.	
	Examiner Thanh T. Nguyen	Art Unit 2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Oath/Declaration

Oath/Declaration filed on 3/24/04 has been considered.

Specification

The disclosure is objected to because of the following informalities:

In page 5, line 13 of the specification, please change “mat3erial” to “material”.

Appropriate correction is required.

Claim Objections

Claims 13 is objected to because of the following informalities:

In claim 13, please replace “0.2 250nm” to “0.2-250nm”. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted

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on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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Claims 1-3, 8-11 are rejected under 35 U.S.C. 102(e) as being anticipated by Li (U.S. Patent No. 2003/0189202).

Referring to figures 2a-6, Li et al. teaches a method for fabricating an electrical connection, the method comprising:

providing an electrically conductive layer of a selected material (14), having a selected thickness, on an exposed surface of a substrate (10) of selected substrate material (see figure 4a);

depositing a thin patterned array, including two or more spaced apart array elements, of metallic nanowire (MeNW) catalyst material of a selected thickness on an exposed surface of the conductive layer so that a portion of the conductive layer lies between the substrate and each element of the catalyst array (20, see figure 4c, paragraph# 42);

providing a gas or vapor of a selected metallic material around the catalyst patterned array, and allowing at least one MeNW to grow, substantially perpendicular to a plane II of the conductive layer, between each element of the catalyst array and the conductive surface (34, see figure 4d, paragraph# 43);

depositing an insulation layer of a selected insulation material over the catalyst array and around the at least two MeNWs so that a gap between at least two adjacent MeNWS contains the insulation material (36, see figure 4e, paragraph# 44);

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applying a chemical mechanical polishing process to remove the catalyst array, a fraction of each of the at least two MeNWs, and a fraction of the insulation layer sp that at least two MeNWs have an end exposed (see figure 4f, paragraph# 48).

2. applying an electrical field E1, substantially perpendicular to said plane II, as said at least one MeNW is grown (see paragraph# 36, 43).

3. applying an electrical field E2, substantially parallel to said plane H, as said at least one MeNW is grown (see paragraph# 36, 43).

8. conductive layer material from a group of materials that includes Cu, Ag, Au, Pt, Pd, Ni, Fe, Co, Ir, Ti, Zr and a metal-doped silicide (paragraph# 41).

9. catalyst layer material from a group of materials that includes Al, Au, Ag, Ni, Ir, Mo, Pt and Pd (paragraph# 56).

10. metallic material for said at least two MeNWs from a group of materials that includes Cu, Cu_xO_y , Al, Al_wCu_z , Ag, Au, R and Pd, where w, x, y and z are positive numbers (see paragraph# 27).

11. insulation material from a group of materials that includes Si, Si_aO_b and Si_cNd_d , where a, b, c and d are selected positive numbers (paragraph# 44).

14. providing at least one of said at least two MeNWs with a diameter, measured in a plane substantially parallel to said plane II, in a range 1-250 nm (paragraph# 31).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4-7, 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li (U.S. Patent No. 2003/0189202) as applied to claims 1-3, 8-10, 11 in view of Jin (U.S. Patent Publication No. 2004/0071951) and Nakano et al. (U.S. Patent Publication No. 2001/0030366).

Jin teaches a method of forming a nanowire (50) and coating the nanowire with a protective film (51, see figure 5a). Nakano et al. teaches the protective film made of TaN or TiN (see paragraph#12).

Therefore, it would have been obvious to a person of ordinary skill in the requisite art at the time of the invention was made would form a protective layer TaN or TiN to protect the nanowire in process of Li et al. as taught by Jin and Nakano et al. because the process would protect the underlying layer as well as act as a diffusion barrier.

It would have been obvious to a person of ordinary skill in the requisite art at the time of the invention was made to optimize the concentration of hydrogen within the dielectric layer, since it has been held that where the general conditions of a claim are disclosed in the prior art (i.e.- thickness of catalyst layer in a range 0.1 - 20 nanometers, and thickness of conductive layer in a range 0.2-250 nm.), discovering the optimum or

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workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233 (CCPA 1955).

The specification contains no disclosure of either the critical nature of the claimed arrangement (i.e.- thickness of catalyst layer in a range 0.1-20 nanometers, and thickness of conductive layer in a range 0.2-250 nm) or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen limitations or upon another variable recited in a claim, the applicant must show that the chosen limitations are critical. In re Woodruff, 919 F.2d 1575, 1578 (FED. Cir. 1990).

Therefore it would have been obvious to a person of ordinary skill in the requisite art at the time of the invention was made would optimize the thickness range of the catalyst layer and the conductive layer in process of Li et al. in order to optimize the process.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh Nguyen whose telephone number is (571) 272-1695, or by Email via address Thanh.Nguyen@uspto.gov. The examiner can normally be reached on Monday-Thursday from 6:00AM to 3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, can be reached on (571) 272-1702. The fax phone number for this Group is (703) 872-9306.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956 (See MPEP 203.08).

A handwritten signature in black ink, appearing to read 'Thanh', with a long, sweeping horizontal stroke extending to the left.

Thanh Nguyen
Patent Examiner
Patent Examining Group 2800

TTN